

## Science as Inquiry

### I Rationale:

With a system as extensive as a rocket, engineers must be prepared to handle situations that could arise during a launch sequence. Simulations provide scientists and engineers the opportunity to test systems and new designs in a relatively safe and cost effective manner. The lessons suggested in this sequence will allow students to explore scientific inquiry with a variety of activities designed to challenge their thinking and creativity.

### II Procedures:

#### 1. Recommended Activities

- “757-Glider Kit”  
(<http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/757.Glider.Kit.html>) - This activity allows students to investigate the design parameters of the wing, tail, and nose of a glider as well as explore the forces of lift, drag, and weight on the flight of the glider.

### III Content Standards Addressed:

#### National Science Education Standards:

- **A.1.1** – Identify questions that can be answered through scientific investigations
- **A.1.2** – Design and conduct a scientific investigation
- **A.1.3** – Use appropriate tools and techniques to gather, analyze, and interpret data
- **A.1.4** – Develop descriptions, explanations, predictions, and models using evidence
- **A.1.5** – Think critically and logically to make the relationships between evidence and explanations
- **A.1.6** – Recognize and analyze alternative explanations and predictions
- **A.1.7** – Communicate scientific procedures and explanations
- **A.1.8** – Use mathematics in all aspects of scientific inquiry
- **B.2.1** – The motion of an object can be described by its position, direction of motion, and speed
- **B.2.2** – An object that is not being subjected to a force will continue to move at a constant speed and in a straight line
- **B.2.3** – Unbalanced forces will cause changes in the speed or direction of an object's motion
- **B.3.1** – Energy is a property of many substances and is associated with heat, light, electricity, mechanical motion, sound, nuclei, and the nature of a chemical. Energy is transferred in many ways

#### National Council of Teachers of Mathematics:

- **A.1.1** – Work flexibly with fractions, percents, and decimals to solve problems
- **A.3.4** – Develop, analyze, and explain methods for solving problems involving proportions, such as scaling and finding equivalent ratios
- **D.1.1** – Understand both metric and customary systems of measurement
- **D.2.1** – Use common benchmarks to select appropriate methods for estimating measurements

- **D.2.2** – Select and apply techniques and tools to accurately find length, area, volume, and angle measures to appropriate levels of precision
- **E.4.2** – Use proportionality and a basic understanding of probability to make and test conjectures about the results of experiments and simulations
- **F.1.2** – Solve problems that arise in mathematics and in other contexts
- **F.4.3** – Recognize and apply mathematics in contexts outside of mathematics

**National Education Technology Standards:**

- **A.2.3** – Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity
- **A.3.1** – Students use technology tools to enhance learning, increase productivity, and promote creativity

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